

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 96-068
NPDES NO. CA0005550

WASTE DISCHARGE REQUIREMENTS FOR:

EXXON CORPORATION
BENICIA REFINERY
SOLANO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Exxon Corporation (hereinafter called the discharger), by application (Report of Waste Discharge) dated December 15, 1994, and subsequent amendments dated February 3, 1995, and April 30, 1996, has applied for reissuance of National Pollutant Discharge Elimination System (NPDES) permit No. CA0005550.

FACILITY DESCRIPTION

2. The discharger owns and operates the Benicia Refinery, a petroleum refinery with an average crude-run throughput of approximately 135,000 barrels per day. The discharger manufactures hydrocarbon products, byproducts and intermediates, and is classified as a cracking refinery as defined by the U.S. Environmental Protection Agency (USEPA) in 40 CFR 419.20.

PURPOSE OF ORDER

3. This NPDES permit regulates the discharge of effluent from the discharger's wastewater treatment plant and the discharges of all storm water associated with industrial activity from the refinery to Suisun Bay and Carquinez Straits, both waters of the United States. These discharges are currently governed by Waste Discharge Requirements specified in Order No. 90-096, adopted by the Board on June 20, 1990. Order No. 90-096 was amended by Order Nos. 91-026 (adopted February 20, 1991), 91-099 (adopted June 19, 1991), and 92-099 (adopted August 19, 1992). The conditions of Order No. 90-096 as amended, were continued in effect past the expiration date, in accordance with NPDES regulations, by letter of the Executive Officer dated June 14, 1995.
4. The USEPA and the Board have classified this discharger as a major discharger.

DISCHARGE DESCRIPTION

5. The discharges are described below and are based on information contained in the Report of Waste Discharge and recent self-monitoring reports. Figures 1 and 2 of this Order show the flow diagram for the process wastewater system. Figures 3 and 4 show the drainage areas and discharge locations for the discharges.

- a. **Waste 001** consists of 2.52 million gallons per day (MGD) on average of treated process wastes including stripped sour water, cooling tower and boiler blowdown, and raw water treatment backwash, ballast water, storm water runoff from process areas, extracted groundwater from on-site remediation activities, and monitoring well purge water from off-site service stations owned by the discharger. Figure 1 shows the wastewater sources of Waste 001.

Oily wastewater streams of Waste 001 are first treated in corrugated plate separators (CPS), and induced static flotation (ISF) units to remove oils and solids. This stream is then combined with non-oily waste streams from the sour water stripper and treated in three parallel activated sludge biological treatment units to which powder activated carbon is added. Treatment continues with three clarifiers in parallel. A portion of the non-oily waste streams are pretreated in an aeration tank followed by a clarifier. Finally, treatment is completed with sedimentation and equalization in a final polishing pond. The reported hydraulic capacity of this treatment plant is 3.74 MGD. Figure 2 shows the wastewater flow diagram for the treatment plant.

Waste 001 is discharged to Suisun Bay (lat. 38°03'18", long. 122°07'07") at a depth of 18 feet about 1,100 feet offshore, west of the Suisun Reserve Fleet Anchorage, through a 12-inch diameter outfall with 3 diffusion ports. The diffuser provides at least 10:1 initial dilution. The general quality of this discharge based on the past 3 to 4 years of data is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	11	<3	50
Chemical Oxygen Demand, mg/l	64	28	133
Total Suspended Solids, mg/l	23	1	103
Ammonia as N, mg/l	0.5	<0.02	4
Oil and Grease, mg/l	1.2	<0.6	7
Total Phenols, mg/l	0.018	<0.005	0.18
pH (standard units)	--	6.3	8.6

The Order approves the discharger's reuse of treated effluent for on-site landscape irrigation, and in the refinery firewater system as a water conservation measure. This reuse is approved provided no irrigation water runoff from the facility occurs, and all water in the firewater system is captured and retreated in the discharger's wastewater treatment plant.

- b. **Waste 002** consists of storm water runoff from an unpaved area of approximately 1.8 acres, located along the western boundary of the discharger's wastewater treatment plant. The area is occasionally use to store equipment and is separated from the plant by a dike. The discharge is through a ditch and several pipes into Sulfur Springs Creek which is contiguous with Suisun Bay (lat. 38°03'53", long. 122°07'37"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	6	--	--
Chemical Oxygen Demand, mg/l	34.1	--	37.2
Total Suspended Solids, mg/l	97.8	--	444
Total Kjeldahl Nitrogen, mg/l	1.3	--	1.5

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Oil and Grease, mg/l	0.5	--	4.6
Total Organic Carbon, mg/l	9.8	--	49.8
pH (standard units)	--	7.1	8

- c. **Waste 003** consist of storm water runoff from a 19 acre unpaved area. The discharge is near the Raw Water Break Tank at the north end of Avenue "A" via a culvert to Sulfur Springs Creek which is contiguous with Suisun Bay (lat. 38°04'49", long. 122°08'12"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	4	--	--
Chemical Oxygen Demand, mg/l	32.8	--	38.8
Total Suspended Solids, mg/l	312.3	--	1160
Total Kjeldahl Nitrogen, mg/l	0.7	--	1.3
Oil and Grease, mg/l	0.4	--	9.6
Total Organic Carbon, mg/l	8.5	--	40.8
pH (standard units)	--	5.9	8.5

- d. **Waste 004** consists of storm water runoff from a 0.51 acre gravel area between First Street and the railway, on the south side of First Street. The runoff is discharged west of Gate No. 4 into the eastern end of a ditch (Beaver Creek), followed by a culvert, another ditch (Buffalo Wallow), and a 72-inch culvert into Sulfur Springs Creek and ultimately Suisun Bay (lat. 38°03'59", long. 122°07'58"). This is a new discharge point permitted under this Permit. The Waste 004 designation may have been used for a different discharge in previous permits. No data are currently available on the quality of this discharge. Monitoring will be required as part of this Order.

- e. **Waste 005** consists of storm water runoff from a 69 acre area that is primarily unpaved (1 % paved surface). This area is located west of the processing area. The area is primarily open space, and consists of roads, parking and administration buildings for contractors, and laydown area for miscellaneous equipment. The runoff is discharged west of Gate No. 4, on the south side of the processing area via a spillway into the western end of a ditch (Beaver Creek), followed by a culvert, another ditch (Buffalo Wallow), and a 72-inch culvert into Sulfur Springs creek and ultimately Suisun Bay (lat. 38°03'58", long. 122°08'05"). A natural spring also discharges to this drainage. The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	9	--	--
Chemical Oxygen Demand, mg/l	51.5	--	75.6
Total Suspended Solids, mg/l	808.5	--	2690
Total Kjeldahl Nitrogen, mg/l	1.5	--	1.9
Oil and Grease, mg/l	2.5	--	4.6
Total Organic Carbon, mg/l	9.1	--	27.8
pH (standard units)	--	7.5	8.4

- f. **Waste 006** consists of condensate from steam traps on the crude pipeline, groundwater seepage, and storm water runoff from a 3.5 acre unpaved area along and under the crude

pipeline, starting at the southwest corner of the crude tank field and running northeast along the perimeter of the tank field and Park Road. It includes runoff from the adjacent city road. The runoff collects in a concrete sump equipped with a containment valve and a hydrocarbon detector which alarms at the central control house and automatically closes the containment valve in the event of a leak. Waste 006 discharges to a ditch to Sulfur Springs Creek and ultimately Suisun Bay (lat. 38°03'50", long. 122°07'57"). A natural spring also discharges to this drainage. The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	4	--	--
Chemical Oxygen Demand, mg/l	27.1	--	28.3
Total Suspended Solids, mg/l	920.8	--	4620
Total Kjeldahl Nitrogen, mg/l	2.5	--	3.1
Oil and Grease, mg/l	0.3	--	5.1
Total Organic Carbon, mg/l	10.3	--	98.9
pH (standard units)	--	6.2	8.2

- f. **Waste 007** consists of storm water runoff from a 0.69 acre gravel and paved area that is about 60% paved. This area forms part of the access road to the refinery and is used for temporary parking of vehicles accessing the facility. The runoff discharges just east of Gate 4 via a tributary ditch (Buffalo Wallow) followed by a 72-inch culvert into Sulfur Springs Creek and ultimately to Suisun Bay (lat. 38°04'02", long. 122°07'54"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	9	--	--
Chemical Oxygen Demand, mg/l	91	--	145
Total Suspended Solids, mg/l	324	--	636
Total Kjeldahl Nitrogen, mg/l	1.6	--	1.7
Oil and Grease, mg/l	0.9	--	1.7
Total Organic Carbon, mg/l	9.6	--	14.6
pH (standard units)	--	7.8	7.9

- g. **Waste 008** consists of storm water runoff from a 0.92 acre graveled railway area. This area is located east of the processing area. The runoff is discharged east of Gate No. 4 via a Culvert, into a ditch (Buffalo Wallow), followed by a 72-inch culvert into Sulfur Springs creek and ultimately Suisun Bay (lat. 38°04'02", long. 122°07'53"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<3	--	--
Chemical Oxygen Demand, mg/l	26	--	28.9
Total Suspended Solids, mg/l	71.7	--	298
Total Kjeldahl Nitrogen, mg/l	1.2	--	1.2
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	5.3	--	10.8
pH (standard units)	--	7.4	7.9

- h. **Waste 009** consists of storm water runoff from a 0.25 acre 50% gravel and 50% paved area, located between the railway and Avenue "A". The runoff is discharged along Avenue "A" on the southeast side of the processing area via a culvert into Sulfur Springs creek and ultimately to Suisun Bay (lat. 38°04'12", long. 122°07'53"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	5	--	--
Chemical Oxygen Demand, mg/l	53.1	--	78.5
Total Suspended Solids, mg/l	29.3	--	63
Total Kjeldahl Nitrogen, mg/l	1.9	--	2.5
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	11.4	--	15.7
pH (standard units)	--	7.4	7.9

- h. **Waste 010** consists of storm water runoff from a 0.84 acre gravel and paved area that is 30% paved. This area is located between the railway and Avenue "A". The runoff is discharged along Avenue "A" on the southeast side of the processing area via a culvert into Sulfur Springs creek and ultimately Suisun Bay (lat. 38°04'12", long. 122°07'53"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	5	--	--
Chemical Oxygen Demand, mg/l	35.7	--	44.9
Total Suspended Solids, mg/l	7.6	--	152
Total Kjeldahl Nitrogen, mg/l	1.1	--	1.1
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	8.4	--	10.8
pH (standard units)	--	7.4	7.9

- i. **Waste 011** consists of storm water runoff from a 0.38 acre unpaved area under and along the crude pipeline on the north side of Park Road. Runoff collects in a concrete sump equipped with a containment valve, normally kept closed, and with a hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff is discharged on the north side of Park Road, where the refinery crude pipeline crosses Park road, via a culvert that discharges into Sulfur Springs creek and ultimately to Suisun Bay (lat. 38°03'52", long. 122°07'57"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	3	--	--
Chemical Oxygen Demand, mg/l	25.5	--	31.5
Total Suspended Solids, mg/l	671	--	1640
Total Kjeldahl Nitrogen, mg/l	1.5	--	2
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	5.7	--	10
pH (standard units)	--	6.9	7.9

- j. **Waste 012** consists of storm water runoff from a 0.78 acre primarily gravel area (10% paved) under a section of the crude pipeline southwest of the crude tank field. Runoff collects in a concrete sump equipped with a containment valve, normally kept closed, and with a hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff discharges into the city of Benicia municipal sewer system and ultimately into the Carquinez Strait (lat. 38°03'15", long. 122°08'19"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<3	--	--
Chemical Oxygen Demand, mg/l	17.6	--	19.2
Total Suspended Solids, mg/l	25.7	--	86
Total Kjeldahl Nitrogen, mg/l	1.13	--	1.6
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	8.1	--	16.9
pH (standard units)	--	7.1	8.0

- k. **Waste 013** consists of storm water runoff from a 1.2 acre (5 % paved) area under the crude pipeline southwest of Outfall 012. Runoff collects in a concrete sump equipped with a containment valve, normally kept closed, and with a hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff discharges into the city of Benicia municipal sewer system and ultimately into the Carquinez Strait (lat. 38°03'08", long. 122°08'25"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	3	--	--
Chemical Oxygen Demand, mg/l	62.6	--	89.8
Total Suspended Solids, mg/l	216	--	562
Total Kjeldahl Nitrogen, mg/l	4.1	--	7.1
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	16	--	41.6
pH (standard units)	--	7.3	8

- l. **Waste 014** consists of storm water runoff from a 0.35 acre unpaved area under the crude pipeline south of Outfall 013. Runoff collects in a concrete sump equipped with a containment valve, normally kept closed, and with a hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff discharges into the city of Benicia municipal sewer system and ultimately into the Carquinez Strait (lat. 38°03'03", long. 122°08'23"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	3	--	--
Chemical Oxygen Demand, mg/l	32.6	--	41.6
Total Suspended Solids, mg/l	123.7	--	374
Total Kjeldahl Nitrogen, mg/l	2	--	3.3
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	9.2	--	16.2
pH (standard units)	--	6.9	7.9

- m. **Waste 015** consists of storm water runoff from a 0.50 acre unpaved area under the crude pipeline southeast of Outfall 014. Runoff collects in a concrete sump equipped with an automatic valve, and hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff is discharges into the city of Benicia municipal sewer system and ultimately into the Carquinez Strait (lat. 38°02'50", long. 122°07'55"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<3	--	--
Chemical Oxygen Demand, mg/l	47.7	--	71.4
Total Suspended Solids, mg/l	9.8	--	29
Total Kjeldahl Nitrogen, mg/l	0.54	--	2.2
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	8.5	--	12.4
pH (standard units)	--	7.5	7.9

- n. **Waste 016** consists of storm water runoff from a 0.07 acre unpaved area under the crude pipeline south of Outfall 015, near the refinery dock. Runoff collects in a concrete sump equipped with a containment valve, normally kept closed, and with a hydrocarbon detector which alarms at a central control house in the event of a hydrocarbon release. The runoff discharges via a culvert into the Carquinez Strait (lat. 38°02'44", long. 122°07'45"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	3	--	--
Chemical Oxygen Demand, mg/l	8.95	--	17.9
Total Suspended Solids, mg/l	63	--	144
Total Kjeldahl Nitrogen, mg/l	0.43	--	0.85
Oil and Grease, mg/l	<1	--	<1
Total Organic Carbon, mg/l	4	--	4.7
pH (standard units)	--	7.2	8.0

APPLICABLE PLANS, POLICIES AND REGULATIONS

- The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (State Board) and the Office of Administrative Law on July 20 and November 13, respectively, of 1995. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface and ground waters.
- Effluent limitation guidelines requiring the application of best available technology economically achievable (BAT) have been promulgated by the USEPA for the Integrated Subcategory of the Petroleum Refining Point Source Category 40 CFR Part 419 on October 18, 1982, and amended on July 12, 1985. These limitations are applicable to the discharge.

8. This Order contains effluent limitations based on recent production rates at this facility. The Board is aware that production can vary in the future and will expedite reissuance of a new permit pursuant to 40 CFR 122.62 and 124.5 upon receipt of an application with new production data.
9. Effluent limitations and toxic effluent standards established pursuant to Sections 208(b), 301, 304, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharge.
10. Pursuant to 40 CFR 122.44, "Establishing Limitations, Standards, and Other Permit Conditions," NPDES permits should also include toxic pollutant limitations if the discharger uses or manufactures a toxic pollutant as an intermediate or final product or byproduct. This permit may be modified prior to the expiration date, pursuant to 40 CFR 122.62 and 124.5, to include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as a part of this Order.

BENEFICIAL USES

11. The beneficial uses of Suisun Bay, Carquinez Strait and contiguous waters are:
 - a. Water contact recreation
 - b. Non-contact water recreation
 - c. Navigation
 - d. Commercial and sport fishing
 - e. Wildlife habitat
 - f. Estuarine habitat
 - g. Fish spawning and migration
 - h. Industrial service supply
 - i. Preservation of rare and endangered species

BASIS FOR REQUIREMENTS

12. Effluent and receiving water limitations in this Order are based on the plans, policies, and water quality objectives and criteria of the Basin Plan, *Quality Criteria for Water* (EPA/5-86-001, 1986; Gold Book), applicable Federal Regulations (40 CFR Parts 122 through 131), the National Toxics Rule (57 FR 60848, 22 December 1992; NTR), and best professional judgement.
13. The establishment of many of the chemical specific limitations depend upon the salinity characteristics of the receiving waters. Data contained in the 1993 and 1994 Annual Report for San Francisco Estuary Regional Monitoring Program for station BF10, and data from the Department of Water Resources (for the years 1993, 1992, 1986, 1985 and 1984) for station D6 located close to the Benicia Bridge show that the salinity of the receiving water is above 5 parts per thousand greater than ninety-five percent of the time. Based on these data, the salinity in the vicinity of the discharges is brackish and marine in character.
14. The effluent limit for copper included in this permit is based on 4.9 µg/l copper as an interpretation of the narrative toxicity objective in the Basin Plan, based on best professional judgement. From a technical standpoint, 4.9 µg/l is currently the best available criterion that is protective of the most

sensitive designated use of San Francisco Bay marine waters with respect to copper: habitat for aquatic organisms. The criterion is based on the Regional Board's study to develop a site-specific objective for copper, which employed the "water effect ratio" approach developed by the USEPA. This approach provides a measure of the binding capacity of natural waters (dependent on particulate matter) relative to the binding capacity of reference waters (filtered oceanic water). The study and associated staff analysis are described in a September 25, 1992, Board staff report entitled "Revised Report on Proposed Amendment to Establish a Site Specific Objective for Copper for San Francisco Bay."

Selenium

15. On February 20, 1991, and June 19, 1991, the Board adopted Order Nos. 91-026 and 91-099, respectively, amending the NPDES permits for all six refineries in the region, including the discharger, to add concentration and mass emission rate limitations for selenium. Order No. 91-026 specified a limit of 50 ppb as a daily maximum. Order No. 91-099 specified an interim limit for the discharger of 2.07 lb/day as a running annual average, and a schedule for compliance with a final limit of 0.96 lb/day by December 12, 1993.
16. On October 16, 1992, the Western States Petroleum Association (WSPA) filed a Petition with the Superior Court for the County of Solano on behalf of the six oil refineries seeking to set aside Order Nos. 91-026 and 91-099. On January 19, 1994, the Board adopted Resolution No. 94-016 which approves the Settlement Agreement between WSPA and the Board. Additionally, the Board adopted Cease and Desist Order No. 94-015 for the three oil refineries not in compliance with the limits specified in Order Nos. 91-026 and 91-099. The discharger is one of these refineries. CDO No. 94-015 set forth a schedule for compliance with the limits by July 31, 1998. This Order reiterates the requirements of Order Nos. 91-026, 91-099. Additionally, the Settlement Agreement and Cease and Desist Order No. 94-015 referenced above remain in effect.

Effluent Limits Added

17. Effluent limits for benzene, toluene, fluoranthene, PCBs, and dioxins (expressed as TCDD Equivalents), and a more stringent monthly limit for mercury and PAHs have been added to the discharger's permit by this Order. Limits on these pollutants are warranted because there are potential sources of these pollutants in the discharger's process wastewater. Mercury, PCBs, dioxins, and PAHs have been measured in San Francisco Bay waters, sediments and/or fish tissue at levels of concern. This last finding is based on data contained in Annual Report for San Francisco Bay Estuary Regional Monitoring Program for Trace Substances (1993 and 1994), and Contaminant Levels in Fish Tissue From San Francisco Bay (Final Report June 1995). Furthermore, the California Office of Environmental Health Hazard Assessment issued in December 1994, an interim Health Advisory on Catching and Eating Fish due to health concerns from exposure to sport fish contaminated with methylmercury, PCBs, and dioxins. The new effluent limits are based on levels necessary to protect the most sensitive beneficial use: human consumption of fish.
18. Discharge data show that the discharge is within the new effluent limits for benzene, toluene, and fluoranthene. So the limits for these constituents are effective immediately. Discharge data also show that the discharge is not within the more stringent limit for mercury. A compliance schedule

is specified for mercury. This is discussed in more detail below. For PAHs, PCBs, and dioxins, the discharge data show non-detects for these pollutants at the analytical reporting limit. However the analytical reporting limit is above the new effluent limits specified. This is discussed in more detail below.

Mercury

19. A monthly average effluent for mercury in Waste 001 is specified in this permit that is more stringent than in the previous permit. Discharge data show that the discharger is currently not able to comply with more stringent limit. This Order specifies a permit compliance schedule in accordance with the Basin Plan. The discharger's preliminary investigation indicates that the source is the crude oil that is processed at the refinery. Also, the discharger reports that current technology being investigated for the removal of selenium may also be effective in removing mercury. The schedule specified takes this into consideration by specifying compliance with the new mercury limit by July 31, 1999.

Analytical Detection Limits

20. At the present time, the analytical quantification limits available from commercial laboratories using approved USEPA protocols are not low enough to determine compliance with the effluent limits for PCBs, and dioxins (TCDD Equivalents). This Order will require compliance with these effluent limits to be determined at the higher analytical quantification limits specified in the Self-Monitoring Program. This is in accordance with policy established in the Basin Plan, and USEPA guidance provided in the NTR and other documents.
21. Because analytical quantification limits may improve, this Order specifies that the Executive Officer may change the quantification limits prior to the expiration date of this permit. However, if quantification limits are improved and analyses show the presence of PCBs, or TCDD Equivalents at levels above the effluent limitation, the discharger may continue to determine compliance at the former quantification limits. In this case, the discharge will be required to implement a source identification study and investigate feasible methods for reducing the pollutant in order to achieve compliance with the effluent limit. This provision to trigger a compliance investigation instead of immediate permit violation is consistent with the Basin Plan policy for compliance schedules in cases where the discharger's current performance has not worsened but the limits have become more stringent and treatment modifications are needed to improve performance.

Chronic Toxicity

22. Pursuant to the requirements of Order No. 92-099, the discharger performed a screening phase monitoring study to determine the most appropriate and sensitive organism for chronic toxicity monitoring. The discharger submitted the results in a report titled "Exxon Company, USA, Benicia Refinery 1994 Screening Phase Monitoring Program" January 1995. Based on the results of this testing, it was determined that a shrimp, the *Mysidopsis bahia*, was an appropriate organism for compliance monitoring for this Permit. This is the same compliance species currently specified in the discharger's permit. The USEPA has recently published Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, August 1995. This document includes a new protocol for a west coast shrimp,

Holmesimysis costata. The discharger will be required in this permit to perform concurrent testing with *Holmesimysis costata* to determine if it is appropriate to change the compliance species to a west coast shrimp.

Benicia Clean Fuels

23. In compliance with new requirements for cleaner burning fuels in California, the discharger constructed and put on-line several new production units. This project is called the Benicia Clean Fuels (BCF) project. These new units include a Methyl Tertiary Butyl Ether (MTBE) plant, saturation plants, and separation towers. A Negative Declaration dated January 1993 was issued for the MTBE Plant and an Environmental Impact Report dated May 1993 was issued for the BCF units. Based on these documents, the new units increase the volume of wastewater discharge by about 181,000 gallons per day, and increase the amount of selenium discharge by 0.04 lb/day. With improvements to the wastewater treatment plant, the current plant capacity accommodated the increase in flows. The slight increase in selenium discharge would be adequately addressed by the interim and final discharge limits specified in Order Nos. 91-026 and 91-099. Therefore, these changes were determined to be insignificant.

Effluent Limits Deleted from Previous Permit

24. Effluent concentration limits for arsenic, cadmium, hexavalent chromium, lead and silver in Waste 001 specified in Order No. 90-095 have been deleted from the list of effluent limits of this Order. Mass emission limits for chromium as required by 40CFR419B have not been removed. The basis for the deletion is that the discharge of these pollutants by the discharger do not pose a reasonable potential to cause, or contribute to an excursion above any numeric or narrative water quality objective. This conclusion is based on consideration of ambient receiving water data and self-monitoring data. The receiving water data relied upon are contained in Annual Report for San Francisco Bay Estuary Regional Monitoring Program for Trace Substances (1993 and 1994), Trace Element Cycles in the S.F. Bay Estuary [Flegal et al., 1991], and Contaminant Levels in Fish Tissue From San Francisco Bay (Final Report June 1995). The self-monitoring data considered was from the past five years (1991 to 1995), and Board staff compliance inspection data from the past three years (1993 to 1995). These data show that the discharge concentrations of arsenic, cadmium and hexavalent chromium are not at ambient levels of concern. These constituents are not used in the manufacturing process by the discharger. The discharge data consistently show either very low levels or non-detect levels below the effluent limit. Monitoring for these constituents will remain in the permit to ensure there are no impacts on these constituent from the Clean Fuels Project changes. A re-opener provision is part of this Order that requires the discharger to notify the Board of material changes in its manufacturing and treatment processes and that would allow the Board to amend the permit as appropriate.
25. The daily average effluent concentration limit of 150 µg/l for PAHs in Waste 001 specified in Order No. 90-095 have been deleted because this limit is superseded by the more stringent monthly average limit for PAHs specified in this Order. Additionally, past discharge data show that the daily average limit is not necessary because there is no reasonable potential for the discharger to exceed the limit. Past data consistently shows levels below 1 µg/l.

Local Effects Monitoring Program

26. The discharger was required as a provision of the previous permit to study the potential for accumulation of metallic and organic compounds, and selenium in San Francisco Bay organisms and sediment. These studies are called the Local Effects Monitoring Program (LEMP). Subsequent to a pilot LEMP conducted in 1991 at the Unocal Refinery in Rodeo, California, the discharger initiated a similar program in 1993 with the bioaccumulation in organisms component conducted as part of a multi-refinery study implemented by the Western States Petroleum Association (WSPA).
27. The discharger submitted a report entitled "Evaluation of Concentrations of Trace Elements and Hydrocarbons in Sediments Adjacent to the Outfall of the Benicia Refinery, Exxon Company U.S.A." dated October 12, 1995. The report concluded that of the 17 trace elements and 72 hydrocarbons analyzed, only cobalt showed significant difference compared to a reference site. However, the cobalt data did not show any spatial trends away from the diffuser.
28. WSPA submitted a report entitled "Local Monitoring Program for Refinery Effluents in the San Francisco Bay-Delta System, Bioaccumulation component (Phase II)" dated January 31, 1996. This report was received by the Board on April 30, 1996, and is currently being reviewed by Board staff.

Regional Monitoring Program

29. On April 15, 1992, the Regional Board adopted Resolution No. 92-043 endorsing the concept of the the Regional Monitoring Plan for San Francisco Bay and directed the Executive Officer to develop and implement a Regional Monitoring Program. Subsequent to a public hearing and various meetings, the Regional Board staff requested major permit holders in this region, under authority of California Water Code Section 13267, to report on the water quality of the estuary. These permit holders, including the discharger, responded to this request by participating in a collaborative effort, through the San Francisco Estuary Institute (formerly the Aquatic Habitat Institute). This effort has come to be known as the San Francisco Bay Regional Monitoring Program for Trace Substances (RMP). The RMP involves collection of data on pollutants and toxicity in water, sediment and biota of the estuary. Annual reports from the RMP has been referenced elsewhere in this Order. In return for the discharger's participation in the RMP, the effluent and receiving water self-monitoring requirements have been reduced for the discharger. For this reason, this order specifies that the discharger shall continue to participate in the RMP.

CEQA AND PUBLIC NOTICE OF ACTION

30. The reissuance of waste discharge requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21000 of Division 13) of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.
31. The Board has notified the discharger and interested agencies and persons of its intent to reissue waste discharge requirements, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
32. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Federal Water Pollution Control Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of Waste 001 at any point at which the wastewaters do not receive an initial dilution of at least 10:1 is prohibited. The discharger may reuse a portion of Waste 001 for on-site landscape irrigation or in the facilities firewater system provided the discharger comply with the provision for reuse specified D.8 of this Order.
2. The bypass or overflow of untreated or partially treated Waste 001 to waters of the State, either at the treatment plant or from the collection system is prohibited. This prohibition specifically includes the bypass of treatment units listed in Finding 5 above. Standard Provisions (attached) Section A.12. addresses bypass conditions and is applicable to the discharger.

B. EFFLUENT LIMITATIONS

Production Based Mass Emission Limits

1. The discharge of **Waste 001** containing constituents in excess of any of the following mass loading limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD (5-day @ 20C)	lb/day	1,890	3,410
	kg/day	859	1,550
TSS	lb/day	1,520	2,380
	kg/day	687	1,080
COD	lb/day	13,300	25,500
	kg/day	6,000	11,600
Oil & Grease	lb/day	551	1,030
	kg/day	250	469
Phenolic Compounds	lb/day	11.9	25.5
	kg/day	5.40	11.6
Ammonia as N	lb/day	1,030	2,270
	kg/day	469	1,030
Sulfide	lb/day	9.99	22.4
	kg/day	4.53	10.2

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
Total Chromium	lb/day	13.8	39.8
	kg/day	6.25	18.1
Hexavalent Chromium	lb/day	1.13	2.55
	kg/day	0.512	1.16

Storm Water Runoff and Ballast Water Allocations

2. In addition to the monthly average and daily maximum pollutant weight allowances shown in B.1, allocations for pollutants attributable to storm water runoff discharged as a part of Waste 001 are permitted in accordance with the following schedules:

STORM WATER RUNOFF ALLOCATION

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD (5-day @ 20C)	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	180	360
Oil & Grease	mg/l	8	15
Phenolic Compounds	mg/l	0.17	0.35
Total Chromium	mg/l	0.21	0.60
Hexavalent Chromium	mg/l	0.028	0.062

BALLAST WATER ALLOCATION

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	240	470
Oil & Grease	mg/l	8	15
pH		within the range of 6.0 to 9.0	

The total effluent limitation is the sum of the storm water runoff allocation, the ballast water allocation and the mass limits contained in B.1. The discharger shall compute the total effluent limitation (both maximum and average) on a monthly basis as shown in Part B of the Self-Monitoring Program.

Selenium

3. The discharge of Waste 001 containing selenium constituents in excess of the following limits is prohibited:

Concentration Limit:
(Daily maximum)^[1]

50 µg/l

Mass Emission Limit:
(Running annual average)^[1,2]

0.96 lb/day

- ^[1] These limits are effective immediately. Additionally, the Settlement Agreement and Cease and Desist Order No. 94-015 (which contains an interim mass emission rate of 2.07 lb/day as a running annual average) remain in effect.
- ^[2] Mass emission rate for selenium shall be based on running annual averages. Running annual averages shall be calculated by taking the arithmetic average of the current daily mass loading value, and all of the previous year's values. For this calculation, the daily mass loading value may be determined using a daily flow based on the average for the week.

Toxic and Conventional Pollutants

4. The discharge of Waste 001 containing constituents in excess of the following concentration limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Average</u>
Copper	µg/l	--	36
Mercury ^[1]	µg/l	0.21 ^[1]	1
Nickel	µg/l	--	65
Zinc	µg/l	--	580
Cyanide ^[2]	µg/l	--	25
Oil & Grease	mg/l	8	15
Total Phenols	µg/l	--	500
Settleable Solids	ml/l-hr	0.1	0.2
PAHs ^[3]	µg/l	0.49	--
PCBs, total ^[3]	µg/l	0.0007 ^[4]	0.3 ^[4]
TCDD Equivalents ^[3]	pg/l	0.14 ^[4]	--

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Average</u>
Benzene	mg/l	0.21	--
Toluene	mg/l	3,000	--
Fluoranthene	µg/l	420	--

- ^[1] The discharger shall comply with the monthly average limit for mercury in accordance with the tasks and time schedule specified in Provision D.1 of this Order.
- ^[2] The discharger may, at their option, meet the limit for cyanide as free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanides. These forms of cyanide shall be measured using the Weak Acid Dissociable Cyanide method described in the most recent edition of Standard Methods, or another method approved by the Executive Officer.
- ^[3] See Attachment A for definition of terms.
- ^[4] At the present time, the analytical reporting limits available from commercial laboratories using approved USEPA protocols are not low enough to determine compliance with the above limits for PCBs, and TCDD Equivalents. Until the analytical protocols are improved or new ones developed to allow measurement of these pollutants at lower levels, compliance with these limits shall be determined at the analytical quantification limits specified in the Self-Monitoring Program. Because analytical quantification limits may be improved, the Executive Officer may change these quantification limits prior to the expiration date of this permit. If quantification limits are improved and analyses show the presence of PCBs, or TCDD Equivalents at levels above the effluent limitation, the discharger shall continue to determine compliance at the former quantification limits, and shall immediately implement the conditions of Provision 4 of this Order.

5. Waste 001 shall not be discharged with a pH outside the range of 6.0 to 9.0.

Whole Effluent Toxicity

6. Waste 001, as discharged, shall meet the following acute toxicity limitation:

The survival of test fish^[1] in parallel 96-hour flow-through bioassays of Waste 001 as discharged shall be an eleven sample^[2] median value of not less than 90 percent survival, and an eleven sample 90 percentile^[3] value of not less than 70 percent survival.

- ^[1] Test fishes as specified by the Executive Officer in the Self-Monitoring Program.
- ^[2] A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

^[3] A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less tests shows less than 70 percent survival.

7. Waste 001, as discharged shall meet both of the following chronic toxicity limitations:

a. an eleven sample median value^[1] of 10 TUC^[2]; and

b. a 90 percentile value^[3] of 20 TUC^[2].

^[1] A test sample showing chronic toxicity greater than 10 TUC represents consistent toxicity and a violation of this limitation, if five or more of the past ten or less tests show toxicity greater than 10 TUC.

^[2] A TUC equals 100/NOEL. The NOEL is the no observable effect level, determined from IC, EC, or NOEC values. These terms and their usage in determining compliance with the limitations are defined in Attachment B of this Order. The NOEL shall be based on a critical life stage test using the most sensitive test species as specified by the Executive Officer. The Executive Officer may specify two compliance species if test data indicate that there is alternating sensitivity between the two species. If two compliance test species are specified, compliance shall be based on the maximum TUC value for that discharge sample based on a comparison of TUC values obtained through concurrent testing of the two species.

^[3] A test sample showing chronic toxicity greater than 20 TUC represents consistent toxicity and a violation of this limitation, if one or more of the past ten or less tests shows toxicity greater than 20 TUC.

8. The discharge of Wastes 002, through and including 016 containing constituents in excess or outside of the following limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
pH	standard units	within 6.5 to 8.5
Oil & Grease	mg/l	daily maximum of 15
TOC	mg/l	daily maximum of 110
visible oil	-	none observed
visible color	-	none observed

C. RECEIVING WATER LIMITATIONS

1. The discharge of wastes shall not cause the following conditions to exist in waters of the State at any place at levels that cause nuisance or adversely affect beneficial uses:

a. Floating, suspended, or deposited macroscopic particulate matter or foam;

b. Bottom deposits or aquatic growths;

- c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;
 - e. Toxic or deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:
- a. Dissolved oxygen: 7.0 mg/l minimum. The median dissolved oxygen concentrations for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation.
 - b. Dissolved sulfide: 0.1 mg/l maximum.
 - c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.
 - d. Un-ionized ammonia (as N): 0.025 mg/l Annual Median, and 0.16 mg/l Maximum at any time.
3. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

D. PROVISIONS

1. **Compliance Schedule for Mercury:** The discharger shall comply with the monthly average effluent limit of 0.21 µg/l specified in B.4 for mercury in accordance with the following tasks and time schedule:

<u>Task</u>	<u>Compliance Date</u>
a. Continue with pilot studies on the effectiveness of selenium removal technologies for removal of mercury from stripped sour water process streams. Evaluate treatment options for non-stripped sour water process streams, and	Upon adoption of this Order

identify and investigate other removal measures which would be necessary to achieve compliance as needed.

- | | | |
|----|---|---|
| b. | Submit quarterly status reports on the work performed pursuant to Task 1.a. and described in detail in Provision D.2. | 15 days following the end of each calendar quarter. The first report is due on July 15, 1996. |
| c. | Achieve full compliance with Effluent Limit B.4 monthly average limit for mercury of 0.21 µg/l. | July 31, 1999 |

2. **Status Reports on Selenium and Mercury Removal Technology:** The discharger shall submit status reports quarterly which at a minimum describes a) the status and results of pilot tests of chosen technology(ies) for removal of selenium and mercury, b) the status and results of other studies being conducted or undertaken by the discharger to reduce selenium and mercury in the discharge, and c) the progress of contracting, construction or implementation activities, and foreseeable delays and actions taken or will be taken to minimize those delays. The status reports are due 15 days following the end of each calendar quarter.
3. **Storm Water Pollution Prevention Plan:** The discharger shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Executive Officer. The SWPPP shall cover the entire facility owned and operated by the discharger. It shall describe the management and handling of storm water runoff from the facility, and measures taken to prevent contamination of storm water or discharge of pollutants with the storm water. As part of the SWPPP, the discharger shall 1) identify on a map of appropriate scale the areas which contribute runoff to the permitted discharge points, 2) describe the activities on each area and the potential for contamination of the runoff, and 3) address the feasibility for containment and/or treatment of the storm water. The discharger shall submit an updated SWPPP by September 1, 1996 to reflect the discharge points covered under this permit. The SWPPP shall specifically address measures for erosion control of steep unvegetated areas which drain to the discharge points.

Henceforth, the discharger shall evaluate and update the SWPPP by July 1 of each year, or sooner if there is a change in the operation of the facility which may substantially affect the quality of the storm water discharged from the facility. The annual update shall be timed with the preparation and submittal of the annual storm water report required in the Self-Monitoring Program. The discharger shall submit revisions to the Executive Officer.


4. **Compliance Schedule for Detection Limited Constituents:** If the analytical methods for PCBs and TCDD Equivalents are improved or new methods developed which improves (or lowers) the analytical quantification limit beyond those specified in the Self-Monitoring Program, and the discharger using the new or improved methods finds either of the above pollutants present at levels above their effluent limits specified in B.4, but below the former analytical quantification limits established, the discharger shall notify the Executive Officer, accelerate monitoring for the pollutant of concern to characterize the discharge, and within 60

days develop and initiate a source identification and reduction investigation acceptable to the Executive Officer. During this time, compliance with the B.4 effluent limits shall be determined at the former analytical quantification limits specified in the Self-Monitoring Program provided the discharger is aggressively pursuing the source investigation.

5. **TRE for Chronic Toxicity:** If there is a violation of the chronic toxicity effluent limitation, the discharger shall conduct a chronic toxicity reduction evaluation (TRE), which shall initially involve a toxicity identification evaluation (TIE). The TIE shall be in accordance with a work plan acceptable to the Executive Officer. The TIE shall be initiated within 30 days of the date of violation. The objective of the TIE shall be to identify the chemical or combination of chemicals that are causing the observed toxicity. Every effort using currently available TIE methodologies shall be employed by the discharger. As toxic constituents are identified or characterized, the discharger shall continue the TRE by determining the source(s) of the toxic constituent(s) and evaluating alternative strategies for reducing or eliminating the constituent(s) from the discharge. All reasonable steps shall be taken to reduce toxicity to the required level. The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the discharger's actions in identifying and reducing sources of consistent toxicity.
6. **Screening Phase for Chronic Toxicity:** The discharger shall conduct a screening phase compliance monitoring under either of these two conditions described in Attachment B of this Order. The discharger shall conduct screening phase compliance monitoring in accordance with a proposal acceptable to the Executive Officer. The proposal shall contain, at a minimum, the elements specified in Attachment B of this Order. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.
7. **Regional Monitoring Program:** The discharger shall continue to participate in the Regional Monitoring Program (RMP) for trace substances in San Francisco Bay in lieu of more extensive effluent and receiving water self-monitoring requirements that maybe imposed by the Executive Officer.
8. **Wastewater Reuse:** The discharger may reuse a portion of Waste 001 for the purpose of on-site landscape irrigation, and in the Benicia Refinery firewater system provided Waste 001 is in compliance with the effluent limitations. Reuse for irrigation may occur only during the dry weather season from June to September exclusive of a one-week period following any rainstorm. The reuse shall occur in such a manner as to not result in runoff that can enter State Waters. All water released from the refinery's firewater system shall be captured and retreated in the wastewater treatment plant.
9. **Self-Monitoring Program:** The discharger shall conduct monitoring in accordance with the attached Self-Monitoring Program as adopted by the Board. The Self-Monitoring Program may be amended by the Executive Officer pursuant to USEPA regulations 40 CFR 122.62, 122.63, and 124.5.
10. **Permit Reopener:** Pursuant to USEPA regulations 40 CFR 122.44, 122.62, and 124.5, this permit may be modified prior to the expiration date to

- a. include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as part of this Order, or
 - b. revise the definition of the NOEL contained in Attachment A of this Order based on guidance or policy from the State Board.
11. **Signatory and Certification:** All applications, reports, or information submitted to the Board shall be signed and certified pursuant to USEPA regulations 40 CFR 122.41(k).
12. **Notification on Changes:** Pursuant to USEPA regulations, 40 CFR 122.41(a), the discharger shall notify the Board as soon as it knows or has reason to believe 1) that they have begun or expect to begin, use or manufacture of a toxic pollutant not reported in the permit application, or 2) a discharge of a toxic pollutant not limited by this permit has occurred, or will occur, in concentrations that exceed the specified limits in 40 CFR 122.42(a).
13. **Standard Provisions:** This Order includes all items of the attached "Standard Provisions, Reporting Requirements" dated August 1993. In part, these Standard Provisions require submittal within 90 days of adoption of this Order, of reports on Safeguards to Electric Power Failure and Spill Prevention and Contingency Plan.
14. **Effective Date of Permit:** This Order shall serve as National Pollutant Discharge Elimination System permits pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall become effective on the date of adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.
15. **Permit Expiration:** This Order expires on May 15, 2001. The discharger must file a Report of Waste Discharge in accordance with Title 23 of the California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.
16. **Rescission of Previous Orders:** This Order supersedes the requirements of Order Nos. 90-095, 91-026, 91-099 and 92-099. Order No. 92-099 is hereby rescinded. Order Nos. 90-095, 91-026, 91-099 are hereby rescinded except as they relate to implementation and enforcement of the above described Settlement Agreement and Cease and Desist Order No. 94-015. The Settlement agreement and Order No. 94-015 shall apply to this Order.
17. The discharger shall comply with all sections of this Order immediately upon adoption.

I, Loretta K. Barsamian, Executive Officer do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on May 15, 1996.


for
LORETTA K. BARSAMIAN
Executive Officer

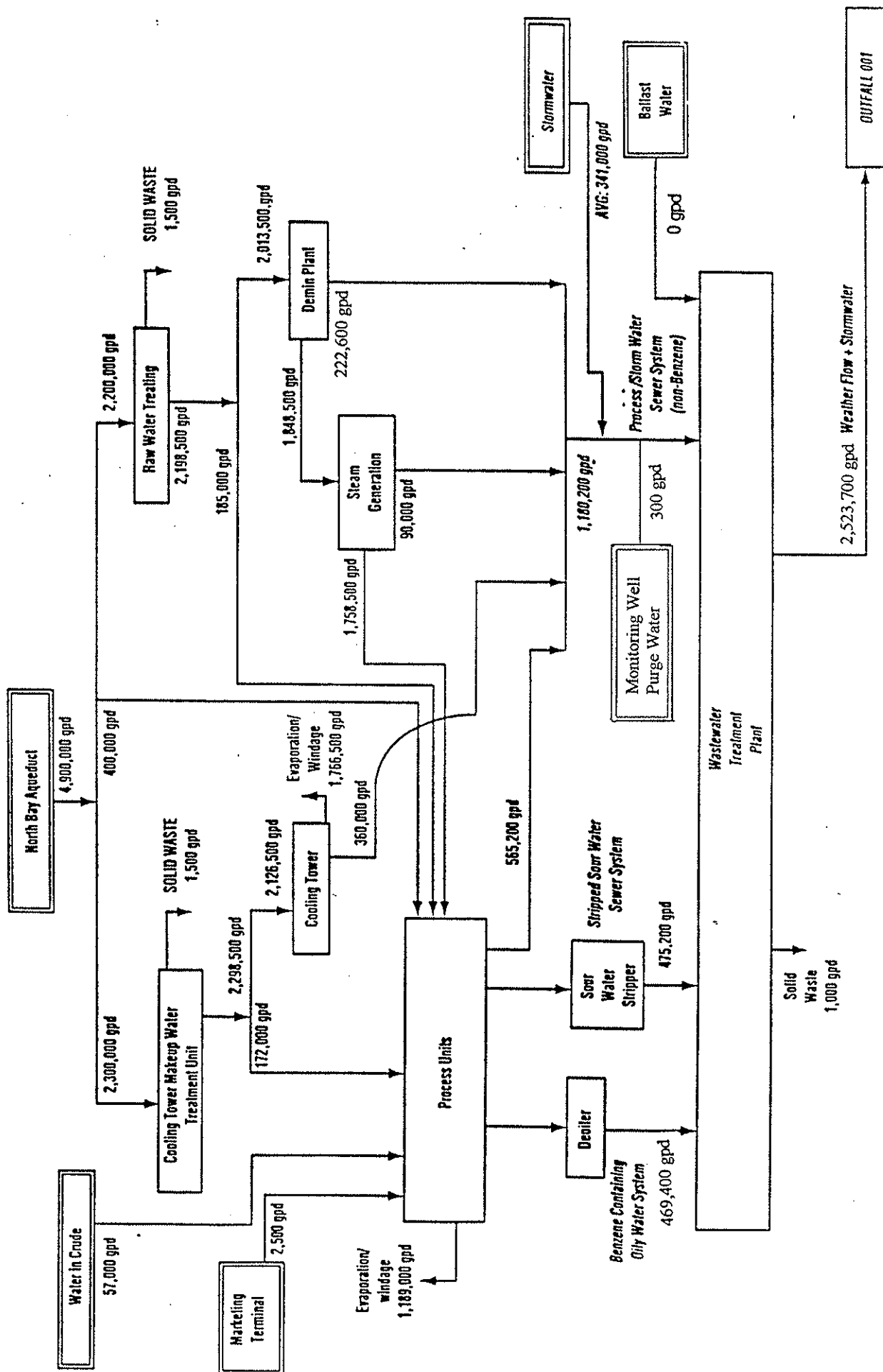
Attachments:

- Figures 1 & 2 - Wastewater Flow Diagrams
- Figure 3 - Storm Water Drainage Areas
- Figure 4 - Discharge Locations
- Attachment A - Definition of Terms for Chemical Constituents
- Attachment B - Chronic Toxicity Screening Phase Monitoring Requirements
- Standard Provisions & Reporting Requirements, August 1993
- Self-Monitoring Program

FIGURE 1

ATTACHMENT 2C-1
ITEM II A

LINE DRAWING OF WATER FLOW THROUGH EXXON CO., U.S.A.
BENICIA REFINERY 135 Kb b/day CRUDE OIL THROUGHPUT



STORMWATER RETENTION PONDS

WHEN 20 YEAR STORM CAPACITY IS EXCEEDED

STRIPPED SOUR WATER SEWER

SOUR WATER STRIPPER

STORM WATER OVERFLOW WHEN FLOW > 2600 GPM AND SURGE AND EQUALIZATION TANKS ARE FULL

STRAINER

SURGE TANK

EQUALIZATION TANK

STRIPPER

WET WELL

AERATION PRETREATMENT

CLARIFIER

ACTIVATED SLUDGE

ISF

CPS

PRIMARY SLUDGE THICKENER TANK

ACTIVATED SLUDGE THICKENER

CONE AND BAKER TANKS

DEOILER ISF

DEOILER CPS

SLOP OIL TANK

OIL COLLECTION

SLOP OIL TANK

BENZENE CONTAINING OILY WATER

FINAL POND

IF FLOW EXCEEDS PUMP CAPACITY

SULFUR SPRINGS CREEK

MINI POND

WHEN FINAL POND IS OUT OF SERVICE FOR MAINTENANCE

EMERGENCY RETENTION POND

IF EFFLUENT WATER QUALITY IS UNACCEPTABLE

WHEN EFFLUENT WATER QUALITY IS ACCEPTABLE

TO PROCESS/STORM WATER SEWER

IF ADDITIONAL TREATMENT IS REQUIRED

OR OFFSITE DISPOSAL

VACUUM TRUCK TO COKER

LEGEND:

- WATER-NORMAL FLOW
- - - WATER-ALTERNATE FLOW
- == SOLIDS
- OIL

EXXON RESEARCH & ENGINEERING CO.
EXXON ENGINEERING-P.O. BOX 101-FLORHAM PARK, N.J. 07932

NOV. 10, 1994

EXXON BENICIA REFINERY

WASTEWATER TREATMENT

FLOW DIAGRAM

AF/SH

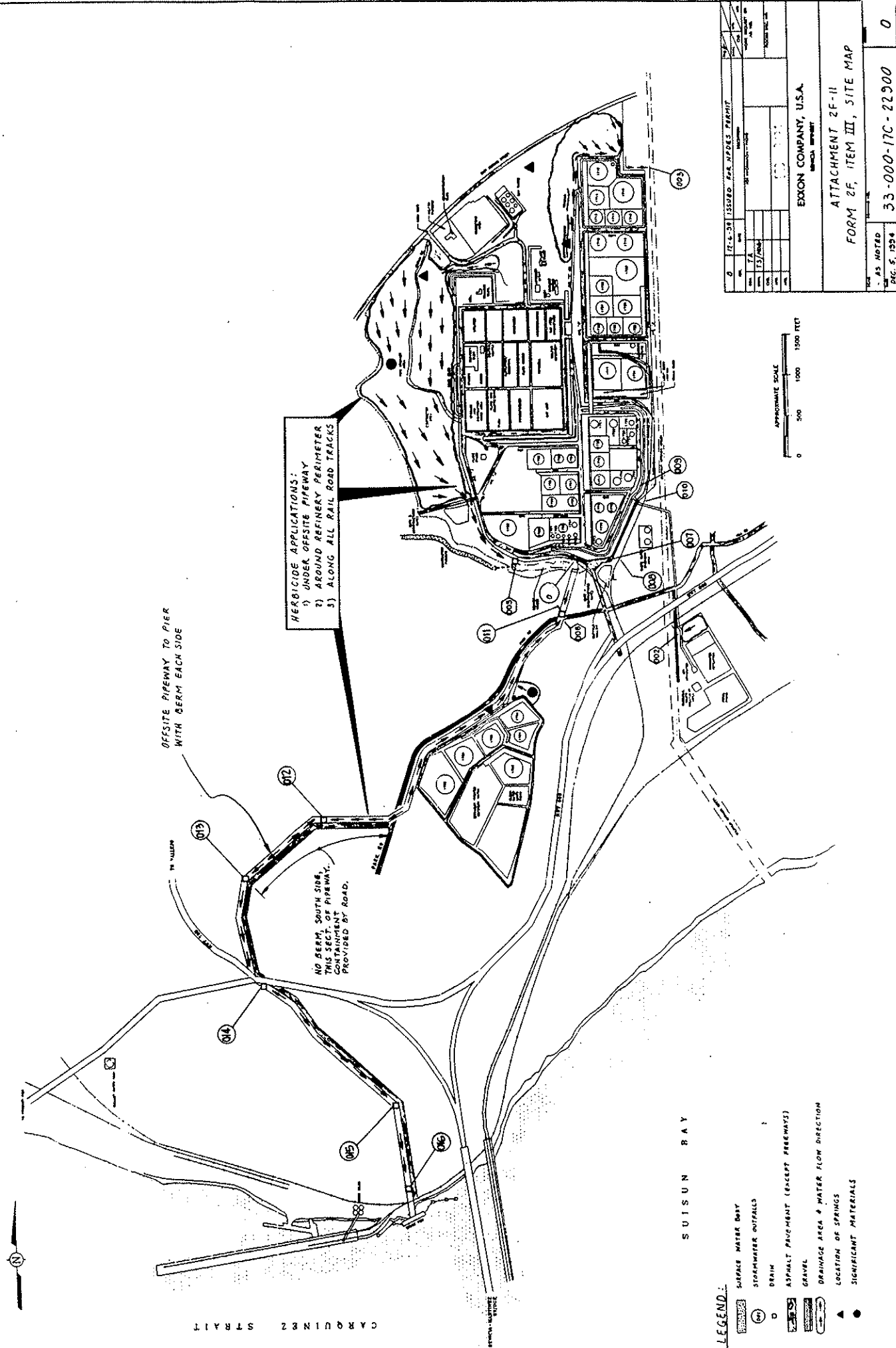
0 10 9 4 12 8

CL-1 CL-2 CL-3

5 2

94-898-2

FIGURE 3



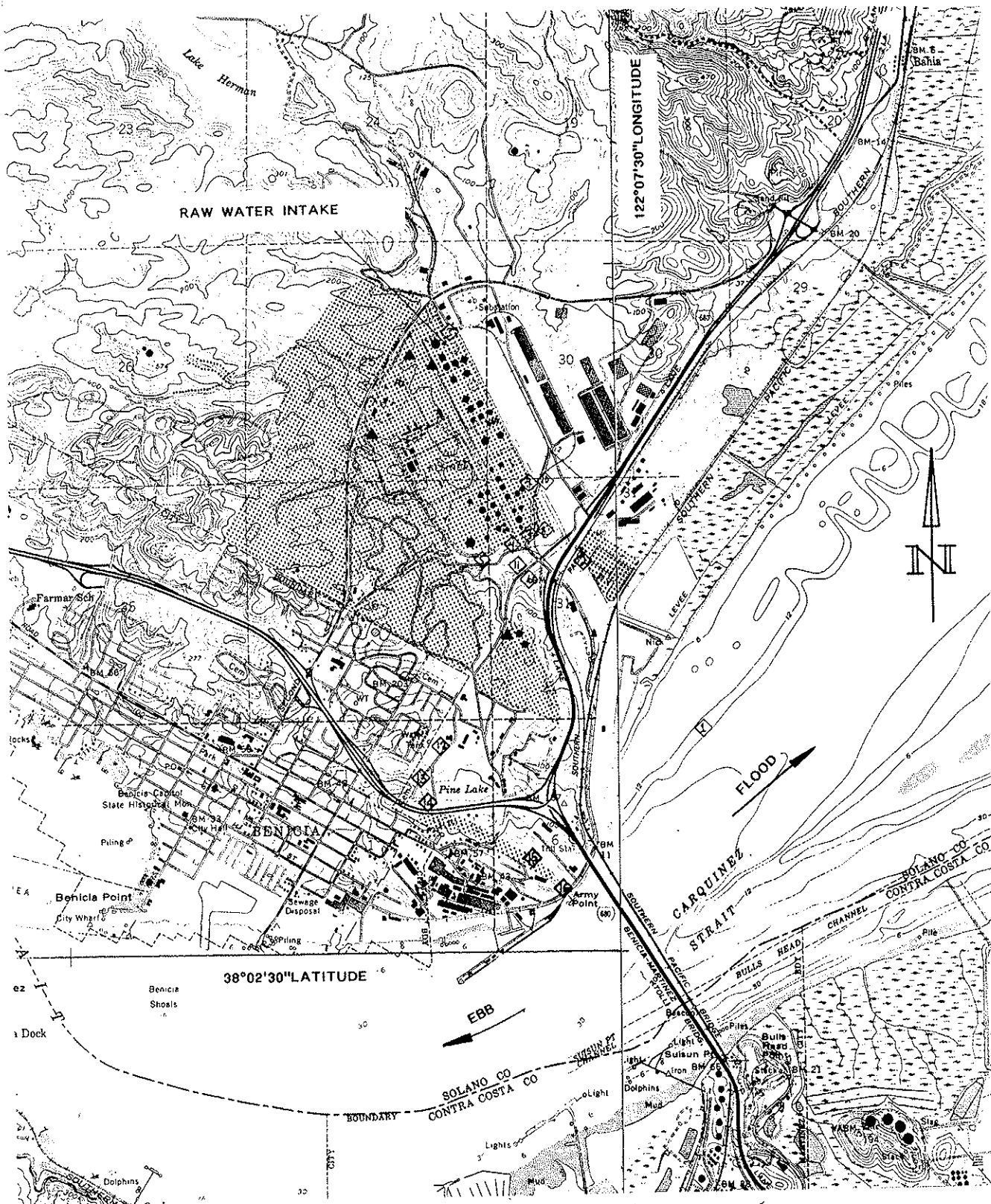


FIGURE 4

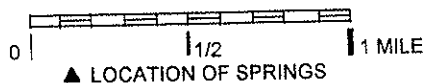
LOCATION MAP

FROM U.S. GEOLOGICAL SURVEY MAPS
BENICIA / VINE HILL, CALIF.

EXXON CO., U.S.A.

SOLANO COUNTY
BENICIA, CALIFORNIA
DECEMBER 5, 1994, PAGE 1 OF 1

SCALE



Outfall Number	Latitude Deg	Min	Sec	Longitude Deg	Min	Sec
001	38	03	18	122	07	07
002	38	03	53	122	07	37
003	38	04	49	122	08	12
004	38	03	59	122	07	58
005	38	03	58	122	08	05
006	38	03	50	122	07	57
007	38	04	02	122	07	54
008	38	04	02	122	07	53
009	38	04	12	122	07	53
010	38	04	12	122	07	57
011	38	03	52	122	08	19
012	38	03	15	122	08	25
013	38	03	08	122	08	23
014	38	03	03	122	08	23
015	38	02	50	122	07	55
016	38	02	44	122	07	45

ATTACHMENT A

DEFINITION OF TERMS FOR CHEMICAL CONSTITUENTS

PAHs (polynuclear aromatic hydrocarbons) shall mean the following constituents. Each constituent shall be limited individually at 0.49 µg/l as indicated below.

<u>Constituent</u>	<u>Unit</u>	<u>Monthly Average Effluent Limit</u>
Benz(a)Anthracene	µg/l	0.49
3,4-Benzo(b)Fluoranthene	µg/l	0.49
Benzo(k)Fluoranthene	µg/l	0.49
Benzo(g,h,i)Perylene	µg/l	0.49
Benzo(a)Pyrene	µg/l	0.49
Chrysene	µg/l	0.49
Dibenz(a,h)Anthracene	µg/l	0.49
Indeno(1,2,3-cd)pyrene	µg/l	0.49

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity equivalence factors, as shown in the table below.

<u>Isomer Group</u>	<u>Toxicity Equi- valence Factor</u>
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

ATTACHMENT B

CHRONIC TOXICITY

I. DEFINITION OF NO OBSERVED EFFECT LEVEL

- A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25} . If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.
- B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Kärber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.
- C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.
- D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. SCREENING PHASE MONITORING REQUIREMENTS

- A. The discharger shall perform screening phase compliance monitoring:
 - 1. subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts, or
 - 2. prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

- B. Design of the screening phase shall, at a minimum, consist of the following elements:
- Use of test species specified in Table B-1 and B-2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;
 - Two stages:
 - Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table B-3 (attached); and
 - Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.
 - Appropriate controls; and
 - Concurrent reference toxicant tests.
- C. The discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

TABLE B-1
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
alga (<u>Skeletonema costatum</u>) (<u>Thalassiosira pseudonana</u>)	growth rate	4 days	1
red alga (<u>Champia parvula</u>)	number of cystocarps	7-9 days	3
giant kelp (<u>Macrocystis pyrifera</u>)	percent germination; germ tube length	48 hours	2
abalone (<u>Haliotis rufescens</u>)	abnormal shell development	48 hours	2
oyster (<u>Crassostrea gigas</u>) mussel (<u>Mytilus edulis</u>)	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - <u>Strongylocentrotus purpuratus</u>); (sand dollar - <u>Dendraster excentricus</u>)	percent fertilization	1 hour	2
shrimp (<u>Mysidopsis bahia</u>)	percent survival; growth	7 days	3
shrimp (<u>Holmesimysis costata</u>)	percent survival; growth	7 days	2
Topsmelt (<u>Atherinops affinis</u>)	percent survival; growth	7 days	2
silversides (<u>Menidia beryllina</u>)	larval growth rate; percent survival	7 days	3

TOXICITY TEST REFERENCES

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995
3. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA-600/4-90/003. July 1994

TABLE B-2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
fathead minnow (<u>Pimephales promelas</u>)	survival; growth rate	7 days	4
water flea (<u>Ceriodaphnia dubia</u>)	survival; number of young	7 days	4
alga (<u>Selenastrum capricornutum</u>)	cell division rate	4 days	4

TOXICITY TEST REFERENCE

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third edition. EPA/600/4-91/002. July 1994

TABLE B-3
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY†	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type			
Freshwater†	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

† The fresh water species may be substituted with marine species if:

- 1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or
 - 2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.
- ‡ Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year.
Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

EXXON CORPORATION
BENICIA REFINERY
SOLANO COUNTY

NPDES NO. CA0005550
ORDER NO. 96-068

CONSISTS OF

PART A dated August 1993
PART B, Adopted: May 15, 1996

PART B

DESCRIPTION OF SAMPLING STATIONS AND SCHEDULE OF SAMPLING, ANALYSIS & OBSERVATIONS FOR EXXON CORPORATION, BENICIA REFINERY NPDES NO. CA0005550

I. Description of Sampling Stations

A. EFFLUENT

<u>Station</u>	<u>Description</u>
E-001	At any point in the outfall from the treatment facilities for Waste 001 between the point of discharge and the point at which all wastes tributary to the outfall are present.
E-002	At any point in the outfall for Waste 002 between the point of discharge and the point at which all storm water tributary to that discharge is present.
E-003	Same as above except discharge is for Waste 003.
E-004	Same as above except discharge is for Waste 004.
E-005	Same as above except discharge is for Waste 005.
E-006	Same as above except discharge is for Waste 006.
E-007	Same as above except discharge is for Waste 007.
E-008	Same as above except discharge is for Waste 008.
E-009	Same as above except discharge is for Waste 009.
E-010	Same as above except discharge is for Waste 010.
E-011	Same as above except discharge is for Waste 011.
E-012	Same as above except discharge is for Waste 012.
E-013	Same as above except discharge is for Waste 013.
E-014	Same as above except discharge is for Waste 014.
E-015	Same as above except discharge is for Waste 015.
E-016	Same as above except discharge is for Waste 016.

B. RECEIVING WATERS

<u>Station</u>	<u>Description</u>
C-NF	At a point in Suisun Bay located 5 meters southwest of the diffuser for Waste 001.
C-MF	At a point in Carquinez Strait located 20 meters southwest of the diffuser for Waste 001.

C-FF

At a point in Carquinez Strait located 150 meters southwest of the diffuser for Waste 001.

II. SCHEDULE OF SAMPLING AND ANALYSIS

- A. The schedule of sampling and analysis shall be that given in Table 1 (attached).
- B. Sample collection, storage, and analyses shall be performed according to requirements in the latest 40 CFR 136, in the Permit, or as specified by the Executive Officer.

III. MODIFICATIONS TO PART A

- A. Exclude paragraphs C.3.b., c., and d.; D.4; E.3; and E.5.
- B. Paragraph C.2.a. is modified as follows:

Composite samples of effluent shall be collected on random weekdays and on any day when substantial changes in flow occur during dry weather conditions.

- C. Section F.5. is modified as follows:

F.5. Annual Reporting

- a. Process Wastewaters:** By January 30 of each year, the discharger shall submit an annual report to the Regional Board covering the previous calendar year for Waste 001. The report shall contain:

- 1) Both tabular and graphical summaries of the monitoring data for all parameters monitored during the previous year.
- 2) A comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharger requirements.
- 3) List of Approved Analyses to include:
 - a) a list of analyses for which the discharger is approved by the California Department of Health Services,
 - b) a list of analyses performed for the discharger by another approved laboratory shall also be submitted as part of the report, and
 - c) a list of "waived" analyses, as approved.

- b. **Storm Water:** The discharger shall submit an annual report by July 1 of each year covering data for the previous wet weather season for the identified storm water discharge points. The annual storm water report shall include:
- 1) a tabulated summary of all sampling results and a summary of visual observations taken during the inspections;
 - 2) a comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharger requirements; and
 - 3) a comprehensive discussion of the progress and/or success of source identification and control programs for non-effluent limited parameters.

IV. CHRONIC TOXICITY MONITORING REQUIREMENT

- A. Test Species and Frequency: The discharger shall collect 24-hour composite samples at E-001 on consecutive days for critical life stage toxicity testing as specified in Table 1.
- B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to monthly (or as otherwise specified by the Executive Officer) when there is an exceedance of either of the following conditions:
1. three sample median value of 10 TUc, or
 2. single sample maximum value of 20 TUc
- C. Methodology: Sample collection, handling and preservation shall be in accordance with EPA protocols. The test methodology used shall be in accordance with the references cited in the Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.
- D. Dilution Series: The discharger shall conduct tests at 100%, 50%, 25%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged. The 100% dilution may be omitted if the marine test species specified is sensitive to artificial sea salts.

V. CHRONIC TOXICITY REPORTING REQUIREMENTS

- A. Routine Reporting: Toxicity test results for the current reporting period shall include at a minimum, for each test
1. sample date(s)
 2. test initiation date
 3. test species
 4. end point values for each dilution (e.g. number of young, growth rate, percent survival)
 5. NOEC value(s) in percent effluent
 6. IC₁₅, IC₂₅, IC₄₀, and IC₅₀ values (or EC₁₅, EC₂₅ ... etc.) in percent effluent

7. TUC values (100/NOEC, 100/IC₂₅, and 100/EC₂₅)
 8. Mean percent mortality (\pm s.d.) after 96 hours in 100% effluent (if applicable)
 9. NOEC and LOEC values for reference toxicant test(s)
 10. IC₅₀ or EC₅₀ value(s) for reference toxicant test(s)
 11. Available water quality measurements for each test (ex. pH, D.O., temperature, conductivity, hardness, salinity, ammonia)
- B. Compliance Summary: Each self-monitoring report shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include the items listed above under Section A item numbers 1, 3, 5, 6(IC₂₅ or EC₂₅), 7, and 8.
- C. Reporting Raw Data in Electronic Format: On a quarterly basis, by February 15, May 15, August 15, and November 15 of each year, the discharger shall report all chronic toxicity data for the previous calendar quarter in the format specified in "Standardized Electronic Reporting Format for Monitoring Effluent Toxicity," October 1994, SWRCB. The data shall be submitted in high density, double sided 3.5-inch floppy diskettes.

VI. MISCELLANEOUS REPORTING

- A. The discharger shall record the rainfall on each day of the month and submit the data with each report.
- B. The discharger shall determine the storm water runoff/ballast water allocation (daily & monthly) for its discharge using the method described in attached Form A. Form A shall be submitted with the monthly self-monitoring report. The daily maximum allocation must be computed for each day Waste 001 is monitored.
- C. The discharger shall retain and submit (when required by the Executive Officer) the following information concerning the monitoring program for organic and metallic pollutants.
 - a. Description of sample stations, times, and procedures.
 - b. Description of sample containers, storage, and holding time prior to analysis.
 - c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal surrogate standard.
- D. The discharger shall submit in the self-monitoring report the metallic & organic test results together with the quantification limits for all constituents approved for analysis under those protocols (including unidentified peaks). All unidentified (non-Priority Pollutant) peaks detected in the USEPA 624, 625 (or 8240, 8270) test methods shall be identified and semi-quantified. Hydrocarbons detected at $<10 \mu\text{g/l}$ based on the nearest internal standard may be appropriately grouped and identified together as aliphatic, aromatic and unsaturated

hydrocarbons. All other hydrocarbons detected at $>10 \mu\text{g/l}$ based on the nearest internal standard shall be identified and semi-quantified.

- E. Ballast water treated and discharged as part of Waste 001 shall be metered and the volume recorded in attached Form A for each calendar day. The 30-day average shall be the sum of the daily values in a calendar month divided by the number of days in that month. Ballast-water allocations shall be calculated by multiplying the volume of ballast water, determined above by the appropriate volume of ballast water, determined above by the appropriate concentration listed under Effluent Limitation B.2. in the permit.
- F. The discharger shall submit with each report a sketch showing the location of all ponds, and treatment facilities of waste discharge. This shall be updated by the discharger as changes occur.
- G. The volume of Waste 001 reused for irrigation shall be recorded and reported in the Self-Monitoring reports. The data to report are the day(s) on which reuse occurred and the total volume used for the month.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

- 1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Order No. 96-068.
- 2. Is effective on the date shown below.
- 3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer, pursuant to 40 CFR 122.62 and 124.4.


LORETTA K. BARSAMIAN
Executive Officer

Effective Date: May 15, 1996

Attachments:

- Table I - Schedule of Sampling, Measurement and Analysis
- Form A - Storm Water/Ballast Water Allocation Procedure

TABLE 1
SCHEDULE OF SAMPLING, ANALYSIS & OBSERVATIONS

<u>Station</u>	<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>	<u>Frequency of Analysis</u>
E-001	Flow	MGD	Continuous	Continuous
	BOD	mg/l	Composite	Monthly
		kg/day		
	TSS	mg/l	Composite	Weekly
		kg/day		
	Settleable Matter	ml/l/hr	Grab	Weekly
	Oil & Grease	mg/l	Grab [1,6]	Weekly
		kg/day		
	Ammonia N	mg/l	Composite	Monthly
		kg/day		
	Total Sulfides	mg/l	Grab [6]	Monthly
	COD	mg/l	Composite	Monthly
		kg/day		
	Acute Fish Toxicity [10]	%Surv	Composite	Weekly
	Crit. Life Stage Tox. Test [11]	[11]	Composite	Quarterly
	pH [2]	-	Continuous	Continuous
	Temperature	Celsius	Continuous	Continuous
	Aluminum	mg/l	Composite	Monthly
		kg/day		
	Arsenic [12]	"	Composite	Monthly
	Cadmium	"	Composite	Monthly
	Chromium, total	"	Composite	Monthly
	Cobalt	"	Composite	Monthly
	Copper	"	Composite	Monthly
	Lead	"	Composite	Monthly
	Silver	"	Composite	Monthly
	Vanadium	"	Composite	Monthly
	Hexavalent Chromium	mg/l	Composite	Monthly
		kg/day		
	Mercury	"	Composite	Monthly
	Nickel	"	Composite	Monthly
	Selenium [9]	"	Composite	Weekly
	Zinc	"	Composite	Weekly
	Cyanide [13]	"	Composite	Weekly
	Total Phenols	"	Composite	Weekly
	PAH's [7]	mg/l	Composite	Monthly
		kg/day		
	PCBs [4]	µg/l	Grab [6]	Yearly
	TCDD Equiv. [4]	pg/l	Grab [6]	Yearly

<u>Station</u>	<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>	<u>Frequency of Analysis</u>
E-001 (cont.)	Benzene [5]	µg/l	Grab [6]	Yearly
	Toluene [5]	µg/l	Grab [6]	Yearly
	Fluoranthene [5]	µg/l	Grab [6]	Yearly
	Standard	-	--	Daily
	Observations			
E-005	Oil & Grease	mg/l	Grab	On each occurrence
	pH	-	"	"
	TOC	mg/l	"	"
	Flow [14]	gallons	Continuous	"
	Specific	µmhos/cm	Grab	"
	Conductance			
	TSS	mg/l	Grab	"
	Copper	mg/l	Grab	"(for first year)[16]
	Nickel	mg/l	Grab	"(for first year)[16]
	Zinc	mg/l	Grab	"(for first year)[16]
	Chromium	mg/l	Grab	"(for first year)[16]
	TPH [15]	mg/l	Grab	"(for first year)[16]
	Total Phenols	mg/l	Grab	"(for first year)[16]
	Standard	-	--	"
	Observations			
E-003, and E-006	Oil & Grease	mg/l	Grab	On each occurrence
	pH	-	"	"
	TOC	mg/l	"	"
	Flow [14]	gallons	Continuous	"
	Specific	µmhos/cm	Grab	"
	Conductance			
	TSS			"
	Standard	mg/l	Grab	"
	Observations	-	--	
E-002, and E-004, and E-007 through E-016	Oil & Grease	mg/l	Grab	Twice Per Year
	pH	-	"	"
	TOC	mg/l	"	"
	Flow [14]	gallons	Continuous	"
	Specific	µmhos/cm	Grab	"
	Conductance			
	TSS	mg/l	Grab	"
	Standard	-	--	"
	Observations			
C Stations	(Receiving water monitoring is suspended in lieu of the discharger's participation in the Regional Monitoring Program)			

Footnotes for Table 1:

1. Oil and grease sampling shall consist of 3 grab samples taken at 2 hour intervals during the sampling day, with each being collected in a glass container. The entire volume of each sample shall be composited prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsings as soon as possible after use, and the solvent rinsings shall be added to the composite wastewater sample for extraction and analysis.
2. Daily minimum and maximum for pH shall be reported.
3. Receiving water analysis for sulfides should be run when dissolved oxygen is less than 5.0 mg/l.
4. The latest versions of USEPA Methods 608 (or 8080) shall be used that to determine compliance with the limits for Total PCBs. The discharger shall attempt to achieve the lowest detection limits commercially available using this method and shall achieve the maximum quantification limit listed below:

<u>Constituent</u>	<u>Quantification Limit</u>
Each Aroclor group	1 µg/l

The latest version of USEPA Method 1613 shall be used to determine compliance with the limit for TCDD Equivalents. The discharger shall attempt to achieve the lowest detection limits commercially available and shall achieve the maximum quantification limits listed below. Analysis results at or below the quantification limits listed below may be considered zero for use in the calculations for compliance determination with the TCDD Equivalents limit.

<u>Isomer Group</u>	<u>Quantification Limit</u>
2,3,7,8-tetra CDD	5 pg/l
2,3,7,8-penta CDD	5 pg/l
2,3,7,8-hexa CDDs	10 pg/l
2,3,7,8-hepta CDD	10 pg/l
octa CDD	25 pg/l
2,3,7,8-tetra CDF	5 pg/l
1,2,3,7,8-penta CDF	5 pg/l
2,3,4,7,8-penta CDF	5 pg/l
2,3,7,8-hexa CDFs	10 pg/l
2,3,7,8-hepta CDFs	10 pg/l
octa CDF	25 pg/l

If the analysis performed for PCBs and dioxins/furans cannot achieve the quantification limits specified above, the discharger shall provide an explanation in the self-monitoring program.

Another sample shall be analyzed if the reported quantification limits are significantly above the limits specified above.

5. The latest versions of USEPA Methods 624 (or 8240), and 625 (or 8270) shall be used. The results from USEPA Method 624 shall be used to determine compliance with the effluent limits for benzene and toluene. The results from USEPA Method 625 shall be used to determine compliance with the effluent limits for fluoranthene. Additionally, all data results from these analyses shall be reported as specified under Section VI.D. of the Self-Monitoring Program.
6. Grab Samples shall be collected coincident with composite samples collected for the analysis of regulated parameters.
7. Polynuclear aromatic hydrocarbons shall be analyzed using the latest version of USEPA Method 610 (8100 or 8310). The discharger shall attempt to achieve the lowest detection limits commercially available. If an analysis cannot achieve a quantification limit for a particular sample at or below the effluent limits for PAHs, the discharger shall provide an explanation in the self-monitoring report. Note that the samples must be collected in amber glass containers. These samples shall be collected for the analysis of the regulated parameters. An automatic sampler which incorporates glass sample containers and keeps the samples refrigerated at 4°C and protected from light during compositing may be used. The 24-hour composite samples may consist of eight grab samples collected at 3-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis.
8. (Not used)
9. Selenium must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA method No. 270.3/ Standard Method No. 303E).
10. Rainbow trout, and three-spine stickleback are to be tested to determine compliance with Effluent Limitation B.8. The discharge may use the Third Edition of the USEPA Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms until otherwise specified by the Executive Officer. The discharger may substitute the three-spine stickleback with fathead minnow if stickleback are not available. In this case, the discharger shall document in the self-monitoring report their attempts to obtain stickleback for testing.
11. Critical Life Stage Toxicity Test to determine compliance with the chronic toxicity limit shall be performed using *Mysidopsis bahia*. Compliance with the effluent limit shall be determined using the more sensitive of the growth and survival endpoints. Within 24 months of adoption of this Permit, the discharger shall perform a minimum of six concurrent tests with *Holmesimysis costata* and submit the data in a report due no later than July 1, 1998.
12. Arsenic must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA Method 206.3/ Standard Method No. 303E).
13. The discharger may, at their option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method No. 4500-CN-I, latest edition.

14. Flow volumes for storm water discharges may be 1) determined using flow measuring devices, or 2) estimated from rainfall data, runoff coefficients and drainage areas, if measuring devices are impracticable.
15. Total Petroleum Hydrocarbons (TPH) for gasoline and diesel, shall be analyzed and characterized by GCFID with fused capillary column. The samples are to be prepared by using EPA Methods 5030 and 3510.
16. Copper, chromium, nickel, and zinc shall be monitored in E-005 for at least the first wet weather year (96/97) following adoption of this permit. If this first year of monitoring does not yield a total of at least ten samples, the discharger shall continue to monitor for these constituents during the following year(s) until a collective total of ten discharge events have been sampled. Samples for TPH and phenols shall be limited to discharges during the first wet weather year or a total of ten samples which ever occurs first.

FORM A

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

This procedure uses a bankbook to inventory stormwater. Any stormwater in excess of the estimated processed stormwater is inventoried. Stormwater allocations are calculated using the actual processed stormwater developed in the attached table.

Definitions:

Dry Weather Season - The months of June to September exclusive of a one-week period following any rainstorm.

Estimated Dry Weather Process Wastewater Flow - The average effluent flowrate during the previous dry weather season.

Stormwater Runoff - The product of the inches of rainfall and the runoff factor.

Estimated Processed Stormwater - The difference between the actual effluent flowrate and the ballast water plus dry weather flowrate.

Stormwater Bankbook - Calculated inventoried stormwater.

Actual Process Stormwater - If the stormwater bankbook is not zero, the actual processed stormwater equals the estimated flow. If the bankbook is zero, the actual processed stormwater is equal to the stormwater runoff for that day plus the bankbook for the previous day.

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Rainfall. (in.)	Stormwater Runoff (MGal/D)	Effluent Flow (MGal/D)	Dry Weather Effluent Flow (MGal/D)	Estimated Processed Stormwater (MGal/D)	Stormwater Bankbook (MGal)	Actual Processed Stormwater (MGal/D)	Ballast Water (MGal/D)

Previous Month's Bankbook =

Previous Month's Bankbook =

Column (B) = Column (A) X Runoff Factor

Column (E) = Column (C) - Column (D) - Column (H).

Column (F): Column (F) = Column (F)(Previous Day) + Column (B) - Column (E).

Column (F) = 0 if Column (F) < 0.

Column (D) = (Dry-Weather Effluent Flow) + (Documented Process Water Increment)

Column (G): If Column (F) > 0, then Column (G) = Column (E).
If Column (F) = 0, then Column (G) = Column (B) + Column (F) previous day.

MAXIMUM DAILY LIMITS							
DATE	BOD (KG/D)	TSS (KG/D)	(KG/D)	O ₂ C (KG/D)	PHENOL (KG/D)	TOTAL CHROME (KG/D)	HEX. CHROME (KG/D)

Maximum Daily Limit = Effluent Limit 8.1. + Stormwater Allocation
(Daily Max in kg/day) (Daily Max)

Stormwater Allocation = Effluent Limit 8.2. x Daily Processed Stormwater x 3.785 1/gal
(Daily Max in mg/l) (in mgd)

Date	Rainfall (Inches)	Storm Runoff Flow (Inches x Runoff Factor) Gallons	Ballast Flow in gallons
1-2			
2-3			
3-4			
4-5			
5-6			
6-7			
7-8			
8-9			
9-10			
10-11			
11-12			
12-13			
13-14			
14-15			
15-16			
16-17			
17-18			
18-19			
19-20			
20-21			
21-22			
22-23			
23-24			
24-25			
25-26			
26-27			
27-28			
28-29			
29-30			
30-31			
31-1			
Total			
Monthly Average			

YEAR:			
30-Day Average	Monthly Average Storm Runoff+Ballast Water Flow Factor (expressed in thousand Gals./day)	Allocation	
		B.1. Total Effluent + Effluent Limits = Limit (kg/day)	(kg/day)
BOD ₅	x 0.098 =	+	-
TSS	x 0.079 =	+	-
TOC	0.22	+	-
COO (kg/day)	x 0.68 =	+	-
O&C	x 0.03 =	+	-
PHENOL	x 0.00064 =	+	-
TOTAL CHROME	x 0.00079 =	+	-
HEX CHROME	x 0.0001 =	+	-